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University of Applied Sciences

IT consultancy for international clients

Ivan Osipov

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Abstract

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Author(s)
Ivan Osipov

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Working inside consultancy agency brings a variety of different clients and projects. For the period 10 weeks I will describe my work for project with international client. First part of thesis would focus on description of a project setup, the second part would consist of weekly diary entries. The scope of this work would include technical and communication aspects of the project.

This diary thesis would introduce technical insights of modern web applications. Application is made with nowadays industry standard technologies and aims to create resilient solution for the client.

It would depict communication process between development team and the client. It aims to show difference between more traditional approach of project management from the client's side and agile approach from development team side. I would focus on a difference between these two approaches and what possible improvements could be done in order to establish trustworthy and efficient workflow.

Diary thesis allows me to have introspection session and helps to evaluate my skills in the beginning of the project and compare them in the end of the project period. I start as a novice actor with basic set of skills and expand my skill set towards skilful performer. My goal is to learn useful skill set that could be adapted in new projects as well.

Keywords
web development, consultancy, communication

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1 Introduction

For a period of 10 weeks, from 16 September 2019 to 22 of November, I would produce a diary about my work in consultancy company. I would reflect on technical assignments and process of communication with a client. Main goals of this thesis are to assess my own skills during this project and be able to improve them further.

My current work includes designing and implementing software solutions. Depending on the project, technical and team requirements may vary. For the last year I have been working as a full stack developer in several projects. Aside from technical skills IT-consultant has collaborated with a client in order to create sensible digital products or services.

In order to describe background and set up of the project, I should introduce involved parties. First, I will introduce the company where I am currently working. Futurice is a digital innovation and engineering company, core business is developing and designing software solutions. Futurice helps clients to transform company cultures, co-creating digital strategies and turning tech into business. Originally the company was founded in Helsinki, Finland in the year 2000 and now there are more than 600 people work for the company in 8 sites with more than 3000 projects completed. (Futurice, 2019)

Our client is an international company which would like to introduce a new service to the global market. Unfortunately, I am not at liberty to disclosure my client due to a binding agreement if non-disclosure. From here on I would refer to it as a client. Project is scheduled from September 2019 to December 2019.

After several initial meetings with the client it has been decided to break down project into smaller sub projects which are distributed to different teams across different sites. Main goal is to produce multiple solutions that could be integrated to current services and localized for given markets.

On project management level, we have a client with multiple entities. There are two project managers who are responsible for the whole project and for each sub-project there is product owner who works tightly with development team on refinement of product backlog and provides necessary materials for given tasks. Project managers and product owners are from client side, in total there are more than 400 sub-projects and for each sub-project there is product owner.

Scrum is a framework for developing, delivering, and sustaining complex products. (Schwaber, Sutherland, 2018). It is the responsibility of our team to promote Scrum methodology, we don't have a Scrum master, but our team is familiar with Scrum framework. Main goal of Scrum framework to create self-organizing teams, Scrum master is required to promote Scrum methodology and remove impediments. However, Scrum master presence in a team is not a requirement.

On a technical level, teams should create reusable components and solutions that other teams could use as well, which significantly reduces time to market criteria. Development teams has access to projects of other teams and able to communicate in specified communication channels.

Teams should use a predefined stack of technologies in order to create products in a consistent manner. By adopting a method of standardizing of tech stack it becomes possible to reduce costs for maintenance and create reusable solutions. Below there is an organizational diagram depicting relation between different parties.

Organizational diagram:

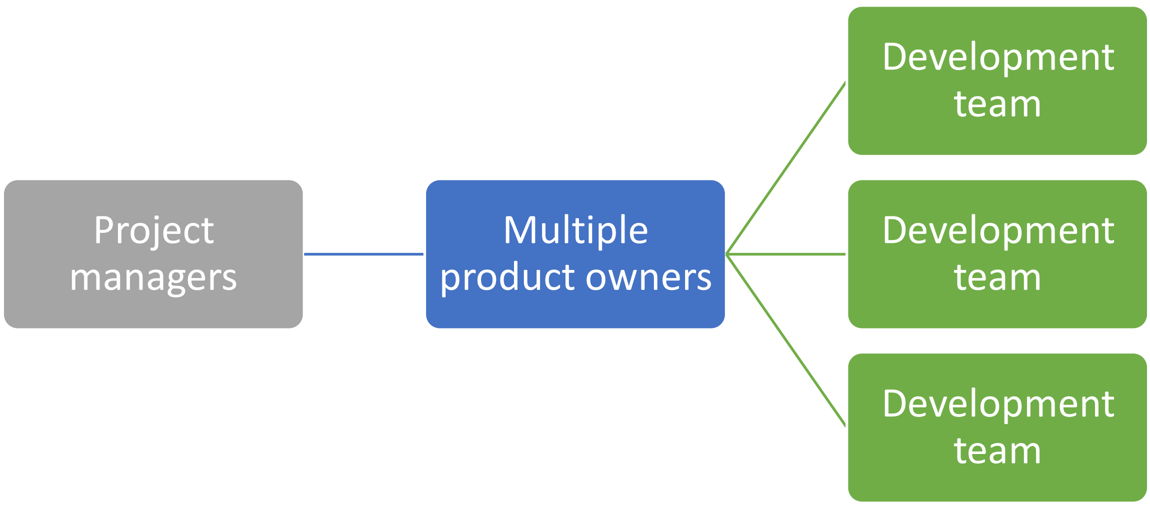

Figure 1. Organizational diagram

2 Framework

2.1 Analysis of current work

My current work as a software developer in a consultancy agency consists of various projects with various set of technologies. Mostly it depends on client architectural set up or client's needs, we help to identify feasible solution for concrete business purposes. It requires me to be flexible in technologies and be able to learn and adapt new solutions.

There is always something new for me in projects, I would say that I am still in the beginning of my career path and a lot remains undiscovered. Usually I would put my attention to the needs of team or project and improve required skills by independent studies or consulting my colleagues. It is required to develop the skill of self-education and curiosity to new technologies, especially in web development where new frameworks are realised very frequent.

Of course, usually I am assigned to projects with familiar technologies for me, but there is always something new to discover. Recently I was working in a project as a frontend developer but also must write code for backend in Java and provision infrastructure. This approach helps me to grow as a professional and be able to be flexible in technologies.

Technical skills are important in consultancy, but it is required to work together with a client to find an appropriate solution. Communication skills are vital for a consultant, it is required to understand client needs and communicate value that given technologies might bring. As a software developer I should think about the quality of code produced and as a consultant I should think about value delivered to customers.

I would say that I am still in the beginning of my path of software developer career, there are a lot of areas that unknown to me. During my time in Haaga-Helia University of applied science, where I got familiar with JavaScript, Java, Databases and infrastructure.

From university we are able to get fundamental knowledge, but in software development, where new technologies and frameworks emerge frequently, developer should promote self-education and curiosity. In my opinion it is very useful for a developer to get hands on experience from real life projects which usually has constraints of budget and time.

Aside from the university classes, I have taken initiative to learn individually modern frameworks for web development. It helped me to understand how to create web applications from scratch and be able to understand how frontend and backend work with each other.

I believe that I would be able to grow as a professional in consultancy company. I would have access to knowledge pool of my colleagues and my skill set would expand form project to project.

2.2 Project structure

We use the Scrum methodology inside team. We have daily meetings with team members and a product owner where we could synchronize. Time constraints for a given project are rather tight, in team we must prioritize user stories. After user stories have been taking into sprint, we start to break them down to technical tasks. At our site we have a team of three developers additionally there are two teams in different sites but with the same size.

We use source control system in order to keep track of changes and ensure consistent code throughout the project. We have adopted policy within the team that two other developers have to review pull request in order it to be merged. We also have access to repositories of other teams in order to reuse solutions if applicable.

Below there is a service high-level diagram which helps to depict how services work in our project.
Web presentation would take input of a customer and then submit it to the backend, where data is validated and stored in cloud-based solutions. In a certain period, the backend sends a batch of the data to business service to generate contracts between the company and customers. Market service receives contracts and contact customers. After contract has been confirmed it is passed to a service provider.

Service high level diagram:

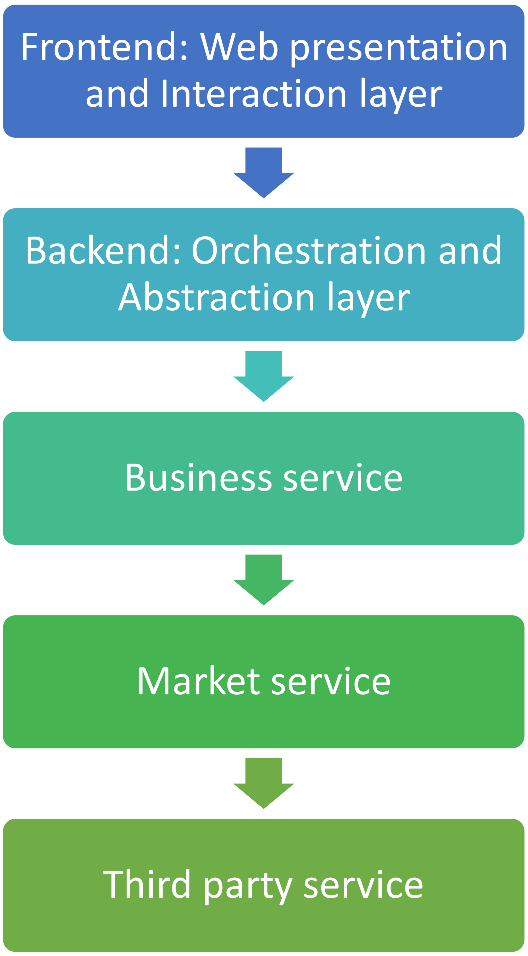

Figure 2. High level diagram

2.3 Project technical environment

We have set up four different environments for different purposes. We usually work at Development environment which is dedicated for development purposes. Updates are triggered automatically when changes happen to development branch in source control system. Next stage is Internal which is triggered after passing End to End tests which run on continuous integration platform. End-to-end testing involves ensuring that the integrated components of an application function as expected. The entire application is tested in a real-world scenario such as communicating with the database, network, hardware and other applications. (Techopedia, 2020)

Two last two stages of our building pipeline are Marketing and the Deployment. Marketing stage is used for presenting a product to marketing teams in order to assess content before releasing it to the public. Basically, Marketing stage is a copy of branch of development branch from source control system. For technical reviews we use Marketing stage, due to at this point product might have multiple change of request and it is not ready to be presented to the public yet. Last stage is Deployment stage which is built triggered by merging development branch in master branch and due to request of a client this action is triggered manually. After all Deployment stage would upload our solution to third-party cloud service and make it available to the public.

Environment pipelines:

Figure 3. Environment pipeline

2.4 Frontend

React is a JavaScript front-end library for building user interfaces ("A JavaScript library for building user interfaces", n.d.), developed and maintained by Facebook. For Frontend we would use React which would help us to build reusable components and create a reactive single page application (SPA).

Redux helps you write applications that behave consistently, run in different environments (Redux, 2015). Application would use Redux as a state management system, this combination is well tested and helps to produce resilient solutions for state handling in frontend.

One of the requirements is to localize our product for specific market, for this we would use I18next library which allows to create a solution that could be modified for other markets as well. I18next is an internationalization-framework written in and for JavaScript. (I18next, 2018).

We would use Formik library which is aimed to cover basic form handling. Formik is a small library that helps you with the 3 most annoying parts:

- Getting values in and out of form state
- Validation and error messages
- Handling form submission

By colocating all of the above in one place, Formik will keep things organized--making testing, refactoring, and reasoning about your forms a breeze. (Formik, 2020).

Frontend stack diagram:

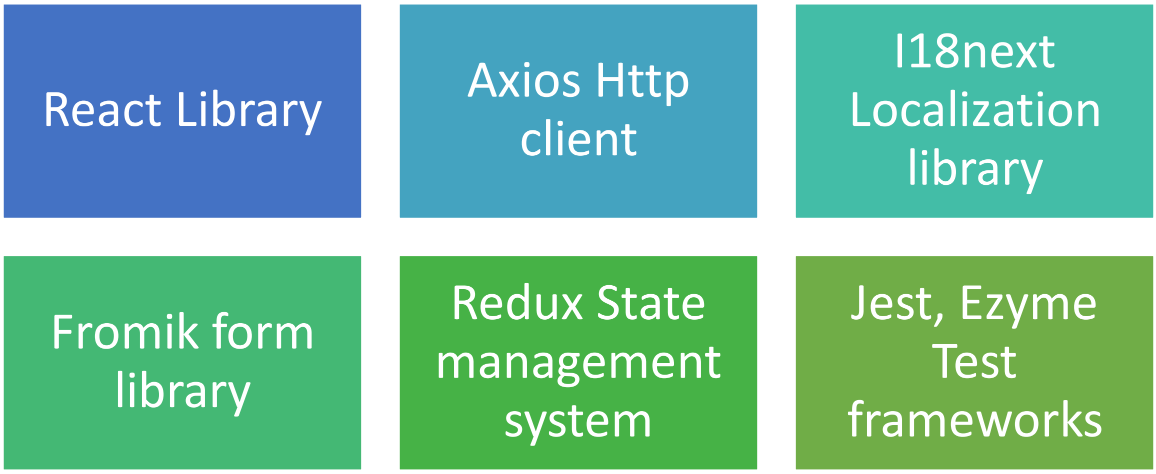

Figure 4. Frontend stack

2.5 Backend

Backend solution is based on NodeJS environment and with the help of Serverless framework it would be possible to create functions that could be executed on Amazon Web Service cloud on demand. Backend would use a variety of third-party services through Axios client. Axios is a promise-based HTTP client for the browser and node.js (Axios, no date).
Typescript would be used for a backend in order to ensure type safety and create documentation for developers who would maintain server later. Typescript is an attempt at improving the limitations of JavaScript for large scale application development. ("Microsoft augments JavaScript for large-scale development", 2012).

Node.js aims to improve developing real-time websites with push capability. The creator Ryan Dahl criticized how the most popular server technology, Apache HTTP Server, and programming style didn't Node.js allows for two-way communication. Typically, clients have always started web responses, but for example with web sockets the server can send information to the client real time. (Tomislaw, no date).

Serverless computing does not mean that there are no servers. It instead means that the servers are provided as a cloud-computing execution model by a provider. The customer gets a "serverless" experience, in that they can execute backend features, but they only pay for the infrastructure when it is called up. When the customer software wants to use the backend, they run functions which call the cloud-based back end. The customer pays depending on the schema, but in Amazon Lambdas case the payment is calculated in runtime in milliseconds. (Miller, 2015).

Backend stack diagram:

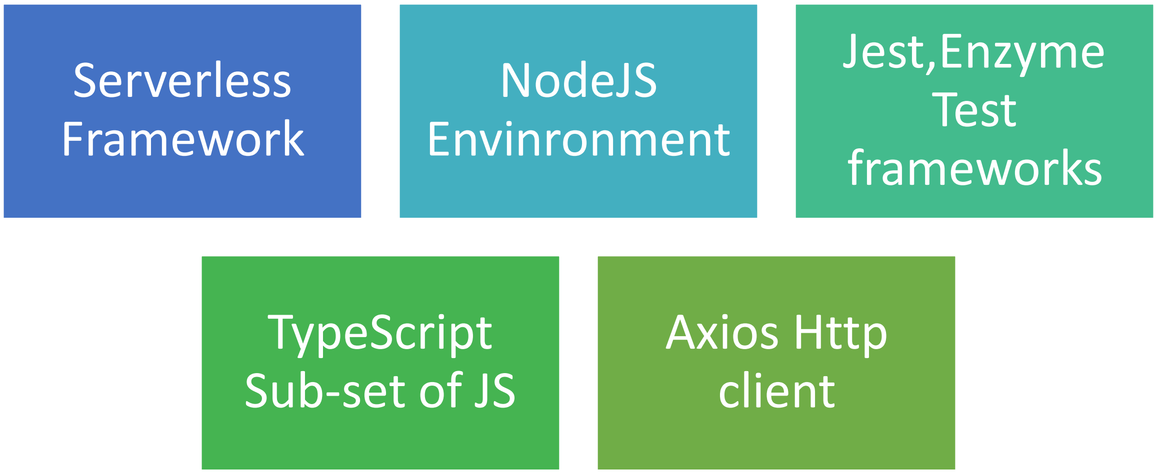

Figure 5. Backend stack

2.6 Unit and end to end tests

One of the requirements for the project is to have Unit tests and End to End tests. Unit Testing is a level of software testing where individual units/ components of a software are tested. The purpose is to validate that each unit of the software performs as designed. (Unit Testing, 2019).

End to End tests would use Test Cafe framework to execute tests in headless browser. We would create successful path which should go through the whole flow of the application and submit valid values, additionally we would create several flows that would submit invalid data and ensure that appropriate error message will be displayed. With End to End test we would simulate real user flow and ensure that our application work as intended.

3 Diary entries

3.1 Observation week 01

Monday 16 September 2019

On a previous week I met one of my team members who will take the role of technical leader in this project. He showed me our working space and told me that there would be another team member joining us from next Tuesday. We have agreed that I would take the role of full stack developer if needed but mostly focus on front end side.

We have discussed documents that we have received from a client, it was presentation of business idea and technical stack which we should use. We found out that no one from our team haven't been working with Formik library before. Additionally, we have discovered that the client has own custom made CSS library which we should use in all projects in order to ensure consistency in design. CSS is a language that describes the style of an HTML document. (CSS Tutorial, no date) It meant that we should get familiar promptly with these libraries, thankfully there was nice documentation about custom CSS library. But we still don't have much idea of what exactly we are going to build.

Tuesday 17 September 2019

We started to set up communication channels and getting familiar with colleagues. I found out that I will be working with two senior developers. One of our team members is going to work part-time in this project since he is going through his master's program in Aalto university.

We have created a lack channel to communicate within our team and with other teams in this project as well. Slack is a collaboration hub that can replace email to help you and your team work together seamlessly. It's designed to support the way people naturally work together, so you can collaborate with people online as efficiently as you do face-to-face. (What is Slack, 2020) We mostly use communication tool Slack within the organization, and we have just recently migrated from another communication tool.

We have realized that we could not start work until we will have authorization from client. We must be authorized to use ticket system JIRA and source control system Bitbucket. Originally, Jira was designed as a bug and issue tracker. But today, Jira has evolved into a powerful work management tool for all kinds of use cases, from requirements and test case management to agile software development. (What is Jira used for, no date).

Bitbucket is source control system which allows developers to collaborate on software projects, it has integrations to JIRA ticket system which helps to connect user stories to pull requests made by developers. We have received in email links to these resources, but it would take a few days to get authorization for these resources.

Wednesday 18 September 2019

Through our colleague on another site we have been introduced to our product owner and we scheduled a conference call for 14:30 Finnish time.

For almost the whole day I was reading documentation about custom CSS library. I was glad that it well written and covers a lot of use cases. Size of documentation was rather big; they must cover styling for different brands and for multiple situations. I have learned that the CSS library takes in account media queries and it allows straightforward create responsive web pages for a products and services. The problem was that we still didn't have a certain image or design mock-ups of what we are going to build. The reason for that was that we didn't have access to ticket system which would provide the necessary materials for development process. I have decided that for today I will get familiar with CSS library and tomorrow is going to make a research on new library for me, Formik.

We had a conference call with product owner and another team member from another site. We had a round of introductions. Product owner explained to us that we are going to renew financial service. Originally this service has existed and was made by another consultancy company, but due to internal changes there was a need for renewal of this service. We have discussed schedule for this sub project, it seems that we have only two weeks to implement due to plans to launch this service in specific date. Additionally, our solution must pass penetration test, which would be carried out by third-party company that specialize on cyber security, I was not familiar on what technologies or techniques are used for penetration test. The purpose of penetration test to identify possible treats in application and focus attention on areas where improvements should be done. The client would like to ensure the safety of their financial service. Penetration test were scheduled on the same week as a tech review. Original estimations were that we should have got access to resources in the beginning of this week and we would have 3 weeks of work.

Product owner said that it might take some time to whitelist our IP addresses and meanwhile we could use a VPN to get access to their resources. A virtual private network, or VPN, is an encrypted connection over the Internet from a device to a network. The encrypted connection helps ensure that sensitive data is safely transmitted. It prevents unauthorized people from eavesdropping on the traffic and allows the user to conduct work remotely. VPN technology is widely used in corporate environments. (What is VPN, no date).

Thursday 19 September 2019

While waiting to get access to resources we decided to go through technical architecture and learn new technologies. The process of getting access to required repositories and services consist of enquiry to client's organization, unfortunately there is no established practice on how to get access. At this point we are not sure what resources are required for us and we have to we have to ask product owner to make an enquiry for us, this approach slows down the process of development.

One of the new libraries for our team is Formik, it is a library which helps to build forms and comes with convenient set of handlers. Formik aims to help produce forms and handles input and validation of forms.

I have decided to read documentation of Formik and see what would could be of use in our case. While reading documentation I have realized that our stack becomes controversial. Because the main idea of a Formik that it provides higher order component to handle the state of the application and for state management we specifically have Redux library. Redux is a state management system that helps to handle state changes in complex applications, of course it could be used in smaller scale applications, but it might not be feasible in terms of effort. Formik claims that it would be enough for handling simple forms and it would handle form state and validation of the form. Both libraries are good candidates for handling a state of the form, but it seems that they functionality overlaps and it might become unnecessary efforts to implement application with both libraries. I have raised this question in Slack channel and asked my teammates in person, it seems that that we all got confused when to use Formik and when Redux. On Slack colleague from another site told me that depends on the situation and if it is simple application, we might not need to use Redux library.

For the rest of the day I was getting familiar how to use Formik library, it seems straightforward and to me it seems that it would be enough for our sub project.

Friday 20 September 2019

Continue to research Formik library and getting to know other teams as well. We had a round of discussions within a team again about some contradictions with technical stack. After lunch we had a call with product owner, and he ensured us that request to whitelist our IP addresses has been made and that we would get access soon.

At the end of the day we have received access to development repository. It consists of three different repositories frontend, end to end tests, backend. Our colleagues helped us to setup repositories and provided boilerplate code for those repositories.

I have pulled repositories to my local machine and started to get familiar with them. However, it was already late and was not able to go through all of them. We have decided that we would start in full speed on next Monday.

Weekly analysis

First week was relaxed in terms of workload, but we have realized that it is not a fast process to get access from client due to the size of organization. However, when we have checked estimations for this week it was stated that work would start this week Monday and some of the progress would be visible by now. By original plan one week of work has past and at this point we only received and access to our repository and we still lacking access to other resources.

We communicated our concerns to our product owner, he said that is understandable that we could not start at the planned time, but in two weeks it was planned to have penetration test and after it first round of tech review. After this news we have the feeling that we have tight schedule and, we have some learning curve to new technologies. It is a usual situation that there are new technologies to study for project and we try to pick projects where we could learn something new. Deadlines that are tight also usual thing, the client would like to get competitive advantage by getting to market on time. These two factors are well known in development life cycle but however it always applies additional pressure.

As a consultancy company we have access to pool of professionals that we can ask help from. We could use communication tools and ask technical questions in specific channels and there is a high probability to get answers. In Futurice there are more than 500 specialists working and usually clients want to meet industry standards, which means that they would like to use well known and safe solutions for their product or services. It is important to remember that we trying to create value for the customer, and we should ask for help if we are having troubles with some of technologies in order to proceed faster. This is a new way of working for me, so far when I was studying, I had to rely mostly on myself and carry out the necessary research for the topics by myself. Of course, we had multiple projects in teams and collaboration between students, but the development and research process for me was rather individual. I must change my approach towards collaborative approach and ask for advice from my multiple peers, in that way I could optimize my research towards unknown topics and produce more value for the customers.

I have understood how communication part is important in this kind of projects, basically we must keep in touch with several remote sites with different time zones. During this week I had to stay longer several times and cancel some of my personal plans due to late meetings, because it was only suitable time slot for other participants.

We have agreed that we would visit client at some point for proper onboarding and knowledge sharing sessions. It would be problematic to do so in a timeframe of first sub-project due to tight schedule, travelling would cost us valuable time lost. We decided to postpone travelling on the client site for later.

I have realized that the number of my daily tools has increased significantly due to client use Microsoft Teams for communication. I have never used before Bitbucket source control system and had to create SSH secure keys in order to use it. Secure Shell (SSH) is a cryptographic protocol and interface for executing network services, shell services and secure network communication with a remote computer. Secure Shell enables two remotely connected users to perform network communication and other services on top of an unsecured network. (Secure Shell (SSH), 2020). JIRA ticket system was new to me and by the first look it seems over a complicated system for such a small sub-project. However, I understand that this is conventions that the client has established, and we should follow them. I just feel a bit lost in the vast amount of services and applications and takes some time for me to find relevant information.

We learned that we would work with different consultancy companies on this project and even though we are direct competitors we should help each other and share knowledge.

This point was not clear to me because we didn't have a means to communicate with other organizations and it seems that for now, we had access to only our repositories so we could not see best practises.

Learning new libraries always take some time and there is a learning curve to it. It seems that the assumption was that we would learn it on a fly, but it would require some amount of iterations and we are really limited with time constraints here. CSS library was showing us examples in plain html we would have to convert it to JSX syntax and integrate with Formik and Redux, which also might add an additional challenge.

Acceptance criteria is that we should have create unit test for every user story and End to End tests as well. We have found out that none of us in the team is familiar with Test Cafe framework which would also some time to learn how to use it properly. We would mostly rely documentation of Test Cafe to learn how to use it and additionally we could also always ask help from our colleagues. So far, I have been working with different solutions for End to End tests, they implement programmatic user behaviour in headless browser. As a developer you must write code for going through different scenarios and make assumption what should be displayed on a screen of a browser. Usually it is good practice to have several paths that user might take. It allows to cover work of whole application as one service and ensure that appropriate result has been reached.

Aside from challenges which were coming to us I have been excited to start a new project and it seems to me that it could be an interesting experience and I will learn new set of skills. I was glad that we have been able to establish a good team spirit since beginning, it felt easy to discuss my concerns and ideas with my team members. We have daily meetings with a product owner and team members, but I feel that we are in constant discussion of what is going on which helps to be up to date. I really appreciate the level of transparency within the team and glad that we have been able to achieve this trust level so fast. It turns out that my team members know each other, and they have been working before in a different project. We had a feeling that it might be tough in terms of time project but would be really exciting as well. In Futurice our work language is English due to multinational personnel and international clients. In our team we have three nationalities and it is convenient for us to use English language in our daily communication.

3.2 Observation week 02

Monday 23 September 2019

On Monday we have gathered with team and product owner for first daily sessions which is organized after lunch time due to time difference. We went through product backlog and identified what should be taken into first sprint. Our sprint size is one week due to short lifespan of this sub project. We have decided to focus this and next sprint in order to ensure that the penetration test would have enough resources to test. After taking a few user stories in current sprint I have noticed that there are multiple stories would be left for next week, almost double the size we took for the first sprint.

I have picked my first ticket from JIRA it was about creating a shell for user journey, which means setup basic routes and pages for user to visit without populating them with fields or adding custom logic. First, I have installed the React Router library from Node Package Manager further would be refereed as npm. React Router library would create a higher order component and wrap our entire application, which would allow create navigation in single page application. Which would mimic real navigation which change of routes in a browser and even have a history of visited pages but still it is SPA.

Basically, we would have in total 4 pages in the user flow and more additional pages available in footer and some pages would have optional pages included. I have decided to create basic pages and create routes for them. By the end of the day simple page flow was created and even navigation buttons were implemented, however pages were just displaying the name of the sections.

Tuesday 24 September 2019

I have completed my first ticket and open pull request for other team members to review. At the ticket information it was stated that ticket is considered done after implementation of all necessary logic and layout and creating End to End tests and Unit tests. At the moment there were no Unit or End to End tests, we decided to ask the product owner if it would be acceptable for us to proceed without them for now. We have identified our main goal for this Sprint would be to get ready for penetration test and create basic user flow. Internally we have decided that we would adopt a policy of two reviews per pull request which means that two developers must approve in order to merge into develop branch.

So far, we have got access to our sub-project repositories and our sub-project ticket system, there are still many other sub-projects repositories of other teams which we didn’t have access to. At daily meetings, we have requested access to repositories of other teams in order to adapt solutions that have been already made and reuse some of components. Our main argument was that we would save time if we don’t have to build them by ourselves from scratch. We have come to an agreement that we would take care of tests later.

My next ticket was to implement initial form for a user. It is the biggest form in this project so far and has many variations due to type of customer could be private or business. There are mutually exclusive form fields with different types of customers. Additionally, validation should be implemented almost on every field. It was a rather challenging task since we must use a new library.

I have decided to start with just implementing UI for this page with no logic whatsoever. That was simple to do but also a time consuming. I was trying to not to extract logic from page to separate files but rather keep everything in one file. So, it would be easier to locate what is going on with the page and see all the functions and components that are used there. In my opinion it would help later for people who are going to maintain this project and make the process of debugging hopefully a bit easier for them.

Wednesday 25 September 2019

Since we have not received access to other repositories, yet I would have to build my own components. I have decided to build React functional components, with this approach it would easier to modularize our application and would be easy to test. My idea was if a specific component is used in different pages, we should abstract logic and create reusable components.

I have continued to work with the same ticket, UI side was starting to look as intended. Next step was to integrate Formik to form input fields. First, I took a naive approach and tried to replicate what was stated in documentation, which works fine for simple form. However aside from just text input I had to take care of Radio buttons, Check boxes and even date pickers. So far, my page was stateless, but I should implement state management for conditional rendering fields based on user input.

Thursday 26 September 2019

We have finally got access to most of the resources and at this point development process was at full speed. We have scheduled the penetration test for beginning of next week, which means that customer journey, at least most crucial parts must work by that time. I have faced some difficulties to implement date picker component, it was not clear from the CSS library what mechanism should be used for its implementation.

Friday 27 September 2019

I was still struggling to find a way how to make date picker component work as intended. From documentation of CSS library, I have learned that its functionality relies on third-party package Flatpickr. I was able to create visual and functional side of component, however there was still not clear how to pass input from this component to form state. My colleague told me that if I am struggling to implement it now, I should switch to another task and leave this component as it is for now.

After our daily discussion with the product owner we have decided to leave aside functionality that is not crucial for oncoming test. We have decided to have simple validation rules for input fields and ensure that user flow works as intended.

Next, we decided to check if we can pass data through our form to other pages. We have implemented form wizard which means that user is taken through a journey of several steps and user could go through steps but not able to proceed forward without inputting valid and required data. Me and my colleague who has worked on the second step of our wizard form realized that we implemented form state each single page but with this approach we don’t pass state to the next step. Basically, it meant that our solution was working for forms with just one page, but we must figure out a way how to implement it for our case. After spending a lot of hours reading documentation and reviewing other repositories, we still were not able to find a suitable solution.

Weekly analyses

This week was rather hectic, we have received access to most of the required resources, but we have lost valuable time due to a process of getting these permissions. Aside from that we faced that we must find a better way to use Formik library in order to make it work as intended. Scheduled penetration test was making us a bit worried due to expectation that testers would access most of our pages and user flow would work as expected. In a case if we miss these expectations, testers won’t have enough to test and therefore security side of our application would be compromised. Consequently, it would bring additional effort for the client to have another round of testing for this product which increase costs.

We have realized that we have a technical issue, our team has never worked with Formik library and it seems that we build our structure in bit wrong way since the beginning. Formik should create top level object to hold values of the form and we now have separate forms which do not communicate with each other. We decided to have session internally in our team and discuss what could be possible solutions here. Unfortunately, it was not possible to find a solution promptly and we must dedicate some team for research.

Additionally, tickets in JIRA was rather massive and we could not merge them due to not meeting acceptance criteria. This factor created a situation that we have extended time needed for the implementation of user story and we were not able to merge its main branch. We lost the ability to build incrementally and whenever we started a new task there was a lot of things created from scratch. To avoid that we have decided to reduce the amount of work for pull requests and merge more frequently.

Inside the team we feel that stress level was increasing due to missing first week of work and pretty much big amount of work ahead. Additionally, we noticed that due to our pull request was trying to satisfy all the requirements became too big to review and accept it fast enough. Which lead to me and my colleague creating similar features in different ways. It could be avoided if we would be able to merge to main branch more frequently and thus would be less deviation. We came to an agreement to create smaller chunks of work and open smaller pull requests so we could build incrementally without getting out of sync.

One aspect was good, since we work in a small team, we could proceed with decisions fast enough. However, our plan is to build reusable components and later from them build whole project. Me and my other teammates must get in sync and use same components so we could be consistent throughout the project. However, size of a ticket is quite big and to satisfy acceptance criteria much work must be done.

Aside from JIRA tickets system we have been provided with an Excel content sheet where fond design mock-ups and description of every element. It was convenient to have this system we could easily see what components are expected and what styles should apply from CSS library. This part was working surprisingly well, and I was able to proceed fast. Additional sections for components were translations and validation rules.

For translation I must create JSON files with key value pairs and when in the code I would refer to specific appropriate translations would be shown. JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate. It is based on a subset of the JavaScript Programming Language Standard ECMA-262 3rd Edition - December 1999. JSON is a text format that is completely language independent but uses conventions that are familiar to programmers of the C-family of languages, including C, C++, C#, Java, JavaScript, Perl, Python, and many others. These properties make JSON an ideal data-interchange language. (Introducing JSON, no date). JSON format could be interpreted by different systems and environments it became an industry standard for sending data via the web. In our case it would be a convenient object like structure for translations, where key is a placeholder and values are actual transaction.

Validation rules were represented as symbols that are allowed and usually length of input was stated. However, there were special cases like handling a birth date validation, date of birth could not be set in future and user must be more than eighteen years old. Another example is postal codes which must be a certain amount of length, should be only numbers and additional check must be done to ensure it is real existing postal code.

I have noticed that during this week me and my colleague who also was working on frontend tasks were out of sync. Original plan was that we take two different pages that share some components and that means that we must agree how to build those components and define a structure as well. Even though we have communicated what we are going to do, and we were trying to discuss our tasks daily, we got a bit different result.

First, structure was different which created duplicated logic in different places across our source code. We both had valid points why it should be the way it was implemented because we have been trying to solve some specific tasks for separate pages. We must take a step back, try to figure out what should be done about structure and agree on common components and they should function.

After some time, we have received access to multiple repositories where we could learn from previous projects and how solutions were implemented. After reviewing previous projects, I have noticed that there is no consistency across projects. It seems that a team decided to find solution individually and architecture of solutions was different from ours, that meant that we could not just reuse existing components, we must adapt them to the needs of our project.

3.3 Observation week 03

Monday 30 September 2019

During the weekends I was trying to find a suitable solution for our obstacle and find the way how to create data flow with Formik library. Found solution which advised to create higher order component and wrap the whole application with it. This approach would allow to access global state of the form across our user journey.

During daily meeting we have agreed to use this method and refactor our code also we have scheduled the penetration test for Wednesday and technical review on Friday. This week would be very intensive, and deadlines are closing fast. I have discussed with my teammate approach with high order component (HOC) and we thought that this might be useful idea. HOC is defined in ReactJS documentation as a higher-order component (HOC) is an advanced technique in React for reusing component logic. HOCs are not part of the React API, per se. They are a pattern that emerges from React's compositional nature it allows to pass data from top components to bottom components. Alternatively, we could use the Redux library to create top level object which could be accessed in any connected component. We have decided to not use Redux library and proceed with Formik library. For whole other day we did pair programming and refactored our whole application. We must change orders of a component and ensure that we are able to pass properties to pages in order to access state of form and validate inputs.

Tuesday 1 October 2019

Method of wrapping our application with higher order component seems to work, but we spent a significant amount of time trying to implement this solution. We had a huge amount of work to do before deploying to test environment for tomorrow's penetration test.

I have started to work on the next story, it was ticket where user is able to submit payment details. One of the requirements was to validate input by regular expression, afterwards use another layer of validation on the client side with the help of external library. After all, two checks are passed, the result is sent to inner service to validate payment details once again. Payment details is a sensitive matter and it demands extra efforts to reduce possible risk.

Colleagues from other sites started to help us by taking some amount of work, mostly on backend. In our team we agree to focus on frontend part and create a feasible user journey which would implement all basic functionality.

I would say it was a stressful day for all our team members, some amount of work was remaining for the next day.

Wednesday 2 October 2019

When I came to office, I have found out that my colleague was not sleeping that night in order to complete all remaining tasks. We have scheduled the penetration test for 10:30 and we still have some time to go through tasks that had be done.

During the test session we have been asked if it is still a work in progress, because some pages were empty. However, test team said that it would take a week to run all the tests and produce reports. Which should be expected in several weeks. We have been told that if critical vulnerabilities would be found they would contact us in an instance.

During the daily meeting we decided to focus implementation of this pages, because next Friday we have planned to have Technical review session and on Tuesday release was planned, where product should satisfy all the criteria. One important aspect was that it was necessary to produce End to End tests and Unit tests for each user story and due to lack of time we have not done them. But thankfully our colleagues from other sites were kind enough to continue helping us.

Thursday 3 October 2019

For the last two days I was working on implementation of user journey, we were able to build reusable components and define our data flow. It was noticeably better and faster experience when we could build incrementally, we have gained a nice velocity and we have been moving towards our goals.

I have started to work on missing frontend sections. It is required to implement user validation which had many rules and restrictions. For an example, user must be over eighteen years old in order to create a contract. I really didn’t want to include a separate library to handle only these criteria, so decided to come up with solution based on native JavaScript features.

On this day I was mostly building a confirmation and summary sections. After payment section, user should reach confirmation page, where appropriate disclaimers should be presented. Optionally user could go to summary page where all the input data would be presented to the user and optionally it could be changed.

Friday 4 October 2019

We had a conference call for technical review with the client and additionally invited parties to check our technical implementation of the product. During the meeting we received feedback that our implementation is lacking Unit and End to End tests and there should be a change of content done. But in general, our application was working fine.

It was good news for all of us, we have put much effort to be able to meet set requirements in such a short period of time. We have been lucky to get help of two developers from other sites which helped us out with building backend and End to End tests. Next step for us would be to wait for official report from technical review and penetration test in order to see what should be done in order to hand over project to customer.

Technical review meeting took almost all working day, the participants were our development team, product owner, stakeholders and software developer from other company specially invited to review our code. Our team attended this meeting by means of conference call, other participants were able to be in the same facility and have a face to face session.

In the beginning of the meeting product owner has presented business idea to stakeholders and defined audience sector for this application. Then he went through two scenarios of user flow, first was for private customers and second for business customers. After presentation of the product there was a round of discussions that were mostly directed to product owner and were about business model itself rather than technical implementation.

We have presented technical architecture to stakeholders and software developer who is responsible for code review. We must follow established by client pattern, however we have excluded Redux library from technical architecture, since we found out that it was not necessary for our case. Our main argument was that it is redundant in this case, stakeholders and code reviewer agree with our statements, they have commented that it is fine to adjust technical architecture to the application needs.

We have been told that we are still not meeting the requirement for test coverage of frontend and backend and that we should increase it to 70% for frontend and 80% for backend. We have been told that they would produce a report where it would be stated what is remains to be done with this application before going to the public. They said that every finding in technical review should be considered as a blocker and should be resolved in order to proceed further on.

Weekly analyses

It was stressful and energy consuming week. We have started to do our tasks basically one week later due to lack of access to necessary resources. We have filled change of request to a client to indicate that work has been done in different time frame as it was estimated in the beginning.

We understood that we should improve our processes of how to work in team. One of the main findings was that we should create smaller pull requests and merge them more often to main branch. Second point was that we should have a better understanding of how the Formik library works in multi-step wizard form. Naturally, it was new technology for us, and mistakes happen when there is not enough experience but most importantly it costs us valuable time lost.

We were able to deliver viable product for penetration tests which caused us a lot of effort and extra work. But thanks to optimizing processes of building our app we were able to proceed in faster pace and additionally we have now help of two more developers from other sites.

I have noticed that our Internal stage on pipeline was not building any more due to failing of End to End tests. The reason for that was that we have updated End to End tests when changes to pages are made, since user flow might change or even text on the button might change and test framework would not be able to locate targeted component.

I have felt that situation for our team was stressful and we have been under pressure, but there was a positive aspect to that, our team took a step to the next level. I think that it has increased trust level in our team, it seems that communication level increased as well. We have been able to find mutual agreement fast and focus on a main objective.

During this week I have learned an important lesson that it is really time costly to stuck with task or looking for the perfect solution. I have realized that I should communicate to my peers that I need help with some tasks in order to solve it faster. It might be reasonable to postpone implementation of a task, it could be more productive to move to the next task, of course if it is not a blocker to next tasks. More importantly that it is vital to ask for help when stuck with the task. Some tasks might be solved by teammates in the past and they could guide you to solution faster.

In conclusion I would say that main value for this week was time, especially lack of it. I have learned that first I should focus on a task which would be optimal investment from time perspective, in other words I should proceed with another task if it is difficult to find a solution. For me it was not clear, because I want to produce good quality code and be sure about solution that was implemented. I must think in a different way, since we have time and budget constraints.

Second important lesson for this week for me was to communicate as much as possible with my colleagues about the architecture of the application. I was too focused to find solution for my case only, of course it is fine as well, since it is natural way when solution evolves from first implementation to more general implementation with abstracted logic for further reuse. This time I must think about the whole application and other teammates which also working to produce solution for other parts of the application. In my opinion it is challenging not to protect your solution but rather try to accept the point of view of another person. Both of us have valid points which could be related to given tasks, but we must work together to find a compromise.

3.4 Observation week 04

Monday 7 October 2019

We have deployed our application to Marketing stage for marketing department to test the content. We have received multiple change requests. Most of them small issues with wrong link been displayed or text should be changed. However, there was another major flaw of the validation schema seems to allow user to input invalid data and continue the journey. We decided to focus on fixing minor issues and updating validation schema.

We have received email from test team that in general there is no security flaws and there are some minor things to take care of. From technical review we received a report with changes that must be done before the product could be released.

We have separated tasks into smaller tasks and started to implement requested changes to the pages, most of them were about content but some were about validation. Bigger task was to write Unit and End to End tests to satisfy 70-80 % coverage. For End to End test we have come up with four different user journeys, first two was successful paths where user able to proceed to the next pages up until completion page. Two other journeys were focused on handling validation errors when input from user was incorrect. For Unit tests we created snapshots of components which gave us 67% of coverage which was not enough to satisfy criteria.

Tuesday 8 October 2019

During internal daily meeting we have found out that even though we have delivered product on time and our product owner was satisfied with the result, management of the client were not satisfied with increased costs and overrun of initial estimations.

Some stories were estimated to take one working day and it took five working days due to a change of requests from product owner and underestimation of complexity of the task. We have been informed that we should have to create change of request before starting to implement stories if they are not in original product backlog. Inside the team we were trying to deliver on specified time, and we were sure that product owner aware of changes. The outcome was that we must stop current activity and wait for approval from project managers that the budget for changes is allocated.

For this day we must go through the work we did and create detailed report why it took longer than initial estimations and what were impediments. We must backtrack through ticket system and source control system and calculate new estimations. With updated change of request with new estimations and submit it to our client for further discussions.

There were more change of requests coming to fix or improve product, but we must postpone our work in order to receive approval for budget for that. We have received a report from product owner that the product is live, and it already generates some customers.

Wednesday 9 October 2019

Meanwhile we have been notified that next sub-project is starting soon, and we should get in contact with new product owner and start estimation process for defined stories. From client's side there are multiple product owners that are responsible for different products or services. Our client established practice of breaking down work into smaller sub-projects which would be managed by different product owners and our next potential sub-project would be managed by new product owner. From materials that we received we gathered general idea about the architecture of the app and business idea. For this project we are going to build payment service that could be integrated with other services like PayPal etc. We have requested meeting with new product owner.

My main objective for this day was to go through documents and create a list of questions that we should ask from product owner in order to get clarity. There were multiple documents with lots of content, it took me whole day to trough half of its content. For me it was hard to create a clear vision of what we would we produce for the next project, it is payment system which should use different means of payment and could be easily integrated to any vendor.

Bigger question for me was how to implement it, handling authentication and financial details is always a sensitive topic. There was not much clarity in documents so far about expected technical implementation, we have decided to ask it from the product owner.

Thursday 10 October 2019

During daily meetings we have found out that we have received approval for a change of requests, and we could proceed working with project. We have separated tasks; I took the task to refactor solution for validation since requirement was to display more detailed error messages to user. For this task I must work with frontend and backend. Firstly, I had to modify logic on the backend, I must extend the original logical implementation of validation and add separate fields to response object, which would give us the ability to show appropriate error message on frontend side. In addition, must update tests since the response object has changed. On the fronted side must check response object for new properties and display appropriate error message. Second task was to remove original content of a page and replace it with external link to legal disclaimer.

After I was done with this work, I have joined the team in the process of estimation of work for new project. This is really challenging to come up with concrete estimation in terms of time and budget. We have received multiple documents which depict business idea and possible architectural solutions. For us was not clear how much of a work is on our side, because there were some third parties involved. After intense brainstorming we have come up with a rough estimation which we going to propose to client tomorrow and maybe renegotiate them as well.

Friday 11 October 2019

We have tried to contact a new product owner in order to get some clarity about oncoming project but unfortunately, he was away this week. We must come up with estimations based on materials that we have. There was another contact person who might help us with estimations, but she was not available as well.

We have estimated three scenarios, first was best case scenario and we estimated that for four weeks of work. Second scenario was the most likely scenario which was about six weeks of work for three developers. And the third one worst case scenario was about nine weeks of work.

Within the team we decided to give estimations individually and then compare them. This would help to get estimations without influence of a group. We went through possible stories and discussed our estimations. After some discussions we have come up with a spreadsheet with possible stories and estimations for them. We have added a section of comments to express our uncertainty about tasks, some tasks may need to add third-party solutions which add additional cost, but it would be wise to use reliable solutions rather than coming up with our own.

Weekly analyses

We went through tasks that we have done for the past two weeks and we must fill detailed report for reasons that actual work took longer than it was estimated before. We have used JIRA and Bitbucket to traverse back in work history and check what extra work was done. Within our team we thought that we were removing impediments and that progress further on is not possible. Additionally, we have been reminded about short deadlines and as a result we did what was necessary without getting approval for budget from management side. We have decided not to proceed with work on project up until the approval of change requests. Client is sensitive to changes and especially if they haven't been notified in advance. We have estimated remaining work in about one full working day and submit our report to client.

It was unexpected to me that client's product owner and project manager had different goals. It seems that product owner was aimed to meet the deadlines and release the product to market at a specific date. Project manager, however, was more concerned that we went over the originally estimated budget. We should not have done any additional work without approval first; this created a situation where we charged our client for work that has been done but not approved. Client was really upset with this approach, but from our side we have been trying to help to reach set goals.

This aspect of working with client was unknown to me, in my opinion, product owner and project manager are one entity with the same goals for the project. It turned out that they have different goals, product owner was aiming to deliver product to market for set deadlines and he was happy that we were able to do that. We have learned a valuable lesson here; we should always send a request for changes to client first and wait for approval. Otherwise work that has been done might be not paid, because originally there was no such agreement for specific tasks.

Some items from change request were not approved at all, client stated that it is our side bugs and that it could not be billable work. It was rather small tasks and process of fixing it would not take long, for example we forgot to put extra space between words. Most of the typos were coming from content sheet and text was in an unknown language to us. This factor adds complexity because it becomes time consuming to proofread text that are displayed on the pages.

For the past week it was more about communication with client and work within a team on estimation of the oncoming project. It feels challenging to come up with reasonable estimations with a lot of unknown factors. In our team tech lead is responsible to handle management sides of our projects but we try to tackle it as a team and discuss uncertainties and trying to come up with a reasonable plan of actions for the next project. We have adapted approach of estimating tasks individually first and then sharing within a team. This approach helps us to spark discussions on areas where there is less certainty and have more diversity in opinions. However, this approach is more time consuming for us, basically we must go through user stories at least three times and then have discussion sessions within a team in order to find a compromise.

Working with multiple entities where decision making process is not clear for us prove to be challenging. From one perspective we are striving to help our client to have high quality service and be on time to the market. From another perspective we should be careful due to budget constraints and constantly changing requirements. With this experience my enthusiasm to new sub-project was diminishing, I have realized that we might get into a situation where we once again would have tight schedule and decision process would not be fast.

For the last few weeks our source of truth - content sheet has been changing four times. Most of the changes of course were small and related to content but there were few changes that affect the whole process and we had to redo logic for several pages. We have learned the hard way that we should watch closely for change of content sheet, since the flow of application might change and it happened so that we have noticed the change too late, at this point we have completed the task. We have discovered that JIRA has feature to watch changes of specific file or page. It would send notification every time file or page were modified. We have set up watcher in order to be aware of new changes in future and avoid situations of redundant work.

Bugs and typos would happen in any project and it is normal process for fixing them, especially in such a short period of time. I was glad that we have been able to deliver such a nice result and release our product to market on time.

Technical review stated that we are not able to proceed further without fixing all the issues mentioned in report, however management decided to release a product and fix these minor things later. This was rather an exception from the rules, however in technical review report stated that overall our application is well made and function as expected. Client has established level of acceptance for products and services and they were expecting to meet their standards, which meant for us some more additional work.

We have not received the penetration test report so far, but we have received an email from person responsible for test that there are no major flaws, only small changes to server configuration would be required.

I think that both these factors have contributed to the release of our product on time, additionally I was thinking that our client was trying to fulfil promises for stakeholders. During the development phase I have checked several times the previous version of the financial service and it was stated that service is not available now and would be available on a specific date.

3.5 Observation week 05

Monday 14 October 2019

Last week there was not much clarity in tasks, since we must mostly do estimations and write reports for work that has been done. For this day, my task was to estimate tasks for tickets created by product owner, it was mostly small fixes of typos and some bugs. However, there was a request from marketing team to improve validation of the street addresses and separate request was to make next button active when user enters all required entries and all entries are valid.

After consulting my team members, I have estimated work as 2.25 developer days for all tasks, next I have created an excel spreadsheet where all these tasks were represented in days and how much those changes would cost. Additionally, to every task I have added a description of what would be done and why it would take a certain amount of time. I have learned that we must be transparent as much as possible with the client. I have shared the spreadsheet with our project manager, and we had a brief discussion on how much more days we would need in order to hand over the final version of the project to client.

Rough estimations were that we would need about seven working days in order to complete all new tasks and fix all findings from technical review. I was advised to be more proactive and communicate with product owner about technical review findings and that he should create user stories that we could take into work. One critical finding from technical review was that we must have 80-90% test coverage for our code, which in my opinion was very time consuming and additionally we have implemented End to End tests which should ensure that all our components work as intended. I have decided to ask product owner would it be feasible if we would not have demanded coverage, but we would have all components and pages tested with snapshots tests and End to End tests would be better guarantee that application works correctly. Snapshots tests help to ensure that your user interface does not change unexpectedly by creating a snapshot of the codebase and comparing this snapshot to a new code in the codebase. It is required to update snapshot tests once there are new changes made to codebase.

Tuesday 15 October 2019

We have received an email from our new product owner and his colleague it turns out they have been on holiday and were not able to contact us for a round of discussions. They have proposed to have a conference call at 15:00. Meanwhile our tasks were to go once again through materials that they have provided and create a list of questions.

For the whole day I was reading materials and diagrams and were making questions that in my opinion would help to create solutions for the client. Mostly my questions were technical and were about how to it is expected from us to implement required services. Additionally, I had several questions about a business logic of new services. From my point of view there is a lot of uncertainties with this project due to complexity and involvement of third parties. It is not clear what is expected from our team and what is provided by third-party services, it makes the process of estimation especially difficult.

At 15:00 there was no call from our new product owner and when we tried to reach them by phone voice mail answered to us. We have been frustrated because we might lose valuable time for development and then having tighter deadlines. Additionally, all our efforts for past days are not billable, basically we spend a significant amount of time for estimation process which is not paid and would not guarantee that we would get this sub-project.

Wednesday 16 October 2019

We have received approval for request we made on Monday to fix typos and small bugs, so we could finally start work. I have taken a task to validate input of email, it seems that we have not checked that repetition of email should be equal to the original email. It was rather fast task, since I am familiar with the structure of the application.

Next, I have decided to continue with the increase of test coverage, I have received an answer from product owner that it would be enough to satisfy technical review criteria if we just have snapshots test for components and pages. I have started to write tests with the Jest framework that allows to render component or page and then my assumption was that it must match snapshot. Main idea of snapshot is to ensure that component or a page has the same code as before. It was time consuming task due to not having much tests in the first place, but at the end of the day I have reached 74.13% of coverage.

Thursday 17 October 2019

I have continued with new task, which was to replace one page with external page, due to legal department request. Basically, I have to remove our own page and just add external link, while doing this task I have noticed that there was a warning in browser console that if I use external links, I should add rel=” noopener noreferrer” for security reasons. This was new to me and I decided to study what possible treat it could create. After some time reading documentation, I have found out that it is possible to redirect users to malicious web site. In our case it was especially sensitive since user input details of their bank accounts.

Next several tasks were about changing content of pages due to marketing department request, originally in content sheet was correct version then we had a change of request to change to a new version that must be reverted now.

At daily meeting our product owner expressed his gratitude towards our efforts, and he said that we set a record on how fast sub-project was done. Also, he said that they started to get real customers for the application from a first day, around twenty customers per day and this was without any promotional activities. It was nice to hear that the application works and brings value to customers.

Friday 18 October 2019

For this day we have complete all the tasks and we have been waiting for a conference call with new product owner. I have been eager to ask questions about new sub-project and get to know people involved there. The call was scheduled for 15:00 Finnish time, we went through set questions several times and we have created a list of thirty questions.

During the call we finally had an opportunity to meet our new product owner, he said that he might not fully answer our technical questions. We asked about the main idea of the project, he answered that it would be payment service which would be easy to integrate to different vendors. Aside from general idea he didn’t explain much about the service.

We decided to go through the list of questions and see if it would help us to understand each other better. We found out that we would work closely with third party service provider which would help to handle payment and ensure the security of transactions. It was nice news; we have been concerned about handling it by ourselves. Next we asked about users registration and we have been told that we would implement it by ourselves, which means it would add up to original estimates due to create different roles for users, restricting some actions for basic users and especially ensuring that user data is handled with extra caution.

After discussion with product owner, we have decided to have inner discussion within a team and share ideas about new sub-project. Personally, I had a lot of concerns since I have never built a payment system and was not sure how to make it secure up to industry standards. Technical lead shared his impression that it would be not complicated, of course we would have to use encryption for user data and some payload of heavy work would be shared with third-party solution that is specialized in handling payments. At the end of the day we have agreed to have last session of estimations on Monday and submit our proposal to the client.

Weekly analyses

Compared to previous weeks this week was light on development side. Most of the time I spend reading materials, in total there were six documents filled with diagrams and high-level description of services. To me it was more challenging than coding, it requires understanding how it is possible to implement such a complex project from different aspects. Additionally, there was no user stories written so we would have to do blind estimations which might not depict the real situation.

Product owner attitude was surprising for me, I have used to that product owner tries to communicate vision of the product to the development team and stakeholders. It seems that expectations were that we would understand everything from those set of documents and when we started to ask more technical questions, he said that is not able to answer them. Of course, product owner doesn't have to be technical person, but it is responsibility of product owner to communicate vision of product to development team and stakeholders.

Estimation process takes a lot of time and I started to worry about the time frame of the project. Judging by the diagrams we should have started the previous week and estimated day of completion is the end of December. We were not sure how much time it would take for us to start to work on this project. During the discussion with the product owner he stated that they would like to meet required deadlines. I was not confident that we would be able to do it and even if we would, we would once again be in very stressful situations with high workload and tight deadlines.

Most importantly that time we spend estimating the projects are not actually billable. We found ourselves in a deadlock situation, we are not able to start the work due to not been able to make estimations due to lack of information. Especially frustrating was that it seems that product owner and his colleagues were not eager to work with us on estimations and were not really communicating with us. So far in my career as a software developer, I was lucky enough to work with product owners who were interested to collaborate with development team, and it was always easy to find a way to clarify what is needed to be done. As we found out later there was another company competing for this sub-project and the client would decide who would get it after estimations are submitted.

Aside from estimation part we start to receive small change of request for previous sub-project. Good part of it that it was live and seems that it was generating new customers for the client. There was now a constant flow of small changes, they are mostly about change of content and improving validation rules for input. We have decided to write down on white board requested changes and discuss them within the team. After a round of discussions, we would estimate how much time each change of request might take. There is of course sometimes request which are more time consuming due to change of logic of the application that would affect other parts. Additionally, we should include time for updating tests for new changes, if our end to end test fail, it won’t build next stage, hence changes would not be available for review.

When estimations for change of requests are done, we send them to the client’s project manager for a discussion. Change requests should be approved in order to start work, some of the changes are bugs on our side which is not billable work from the client point of view. We have found few bugs and some improvements that should be done to the application, but we must implement solution for them in our own time. There was one warning from React library side that when we start to input data our component changes from uncontrolled to controlled component. I have read in official documentation of the React library that components preferably should be controlled, especially in the case of forms. There were two options to handle this situation, first we could pass initial values to component to make it controlled component and second was option add fallback for input that would assume that if there is no value use some predefined fallback value. We have spent two days to find out why we still get a waning, even though we have implemented first option and we had default values for all form entries. In the end in turned out that we made a typo when we passed initial values and we have not noticed it at pull request reviews.

I do understand that it is part of the work of IT consultant to work closely with the client and it demands communication and business skills to be able to find optimal solution for the needs of the client. I would even say communication part is essential in work of a consultant it helps to define what needs to be done to deliver desired value. Development skills are crucial of course but even if developer is highly skilled but there is not much value to customer if there is no clarity on what should be implemented.

We have communicated our concerns to person responsible for this project in our company, he was surprised with this attitude. We told that there is no base work done in creating user stories in JIRA and we were not sure what is expected from us. It seems that the scrum framework was not applied here. We have been advised to wait for new sub-project and not focus our time on this one. We found out that there are multiple sub projects would be available in a short time.

3.6 Observation week 06

Monday 21 October 2019

This week with looking at oncoming sub projects, there were more than fifteen possible sub-projects for our team. We should choose a couple of them and make estimations and then submit a proposal to the client. We found several sub-projects which were like our current sub-project, we realized that it would be easier to estimate work since we are familiar with it and we would be able to reuse our solutions. Of course, there were differences, we must adapt new sub-projects for different countries which might affect some rules of payment for example.

We have entered a new phase of work, where we were more in maintenance mode for our first sub-project and we were estimating work for new sub-projects. At daily meetings with product owner we have found out that there would be more change of request coming today to our backlog, due to marketing department requests. I was glad that we would have new tasks for this week.

Tuesday 22 October 2019

We have received new change of request in our backlog and we started immediately estimation process, since it would require some time to review our estimations. I have written them down on a white board and we had discussion sessions with my team members. Most of the request were once again about content change which would be fast to implement, however some tasks were about improving our validation for user input. Client wants to ensure that appropriate data would be entered, and we should sanitize input data. Especially there was a request to ensure that addresses would be entered correctly, it was challenging to implement, now in our project we have one field for street address and house number. It was reported by the marketing department that it was just possible to enter numbers in street address field, the requirement was to ensure valid addresses was submitted.

We have submitted our change of request to the client and we have returned to the process of estimating new sub-projects. I would say that I think we become better with this process, like our cases we know what services we could just consume and what permissions are needed for use of these services. We have spent 35 % of our estimated time for getting permissions for required services in our last sub-project, we aim to avoid it this time.

Wednesday 23 October 2019

For today we have received approval for our change of request, which means we could start to work on them. Additionally, we found out that our colleague from another site would visit us tomorrow and we could discuss sub-projects and help each other to make estimations for new ones.

I have picked up a set of small tasks for this day, the first task was to remove links to App and Play store from confirmation page. It was rather easy task; I just need to make sure I would remove static assets as well.

Second task was to redirect user to landing page, once user journey is over. Now we redirect user to the beginning of our journey, since we did not have a landing page in our content sheet. It was also simple task, I have created link wrapper for a button, so when user would be able to press on the button rather on text. After this task there were few more simple ones with change of content.

For the second part of the day I have took task for validation of a street address. My concern was not to restrict input of the user to specific format and let the user decide how address should be spelled. It would be complicated to try to catch all the corner cases which might lead to not pleasant user experience and exclusion of some users. I was thinking that for this task it would be better to implement some check in addresses databases, but now the check is done with regular expressions A regular expression is a method used in programming for pattern matching. Regular expressions provide a flexible and concise means to match strings of text. (Technopedia, no date). Regular expressions help to validate user input in our case. I have excluded special characters from input and created a rule that it should be at least one letter and one digit in input field. Of course, it is not a perfect solution and it would allow to input invalid data, but in my opinion, we should leave choice to a user.

Thursday 24 October 2019

During daily meetings with a team we have booked a meeting room for a round of discussions with our colleague from another site, he was visiting Helsinki and we have decided to have knowledge sharing session. We would have a meeting at 11:00 and before this time I have decided to take a new task with validation of personal details page. It seems so that the marketing department have come up with better validation rules that were trying to narrow down the amount of invalid data.

Originally, we have estimated this task for one full working day, since a lot of fields need to be re-evaluated. I have started to work with regular expressions and was halfway through my task when my colleague told me that it is time to go to the meeting.

During the meeting I had a chance finally to meet our colleague from another site in person, we have decided to first show our project and explain what services we implemented by ourselves and what do exist in client's repositories. By sharing knowledge about our sub-project, we could help our colleagues to estimate efforts needed for journey and be aware of the possible difficulties that may arise.

We demonstrate our sub-project and our colleague says that our projects look similar. Then it was his turn to show what was done and how to interact with client’s services. We have noticed that indeed our projects look similar, however they had implemented financial check service on their own, due to specification of the market and they were not able to reuse services from the client’s repositories.

After long discussions we started processes of estimation for new sub-projects, it took all our rest of the day. So far, we have estimated two new sub-projects and one sub-project we should hand over soon.

Friday 25 October 2019

I have returned to my task of validation of user input for personal details, most complicated part was to validate email address, since our product owner requested to have specific format and have not specified what is allowed for special characters. After doing some research I have come up with regular expression that would satisfy criteria of product owner.

There was an additional change of request for updating content, we have decided to proceed without standard procedure since it would just take more time to get it approved rather than just updating one text field.

During the day I have checked out our build pipeline, it seems that it was failing to build “Internal” stage due to failing End to End tests. We should ensure that our pipeline work correctly because it is environment used by marketing department and that is how they evaluate our work. I have created a new branch and run test locally to identify the source of the problem. It turned out that due to recent changes to the user flow all our End to End test were failing. It was fast fix, but it required knowledge of how our End to End tests work.

Weekly analyses

We have entered a new phase of working flow, there is current sub-project which demands attention and fixes and there is work of estimating new projects. Both tasks demand technical skills and communicational skills. We must work closely with product owners and other teams in order to produce reusable software solutions.

I have received a request to participate in rotation for a new project which would start from November. It was really confusing for me, because I feel that we have finally understood how to work with this client and become more familiar with the technical architecture. However, there was a point for rotation since person who would substitute me is able to work for only a few months and it would be a suitable time frame for current project. From a technical point of view, it was similar technical requirements and switching projects should be relatively easy, but of course there would be new challenges. Some of the challenges would be getting on boarded to new client and getting aligned with a new team. There might be new technologies for me, so far, I have seen only a brief overview of oncoming project.

We have discussed inside the team that new person would have to trough on boarding with client and should be aware of working processes. Especially about filling out the change of requests before doing work. Still this matter would be discussed with several participants of the current project, there is business value for this rotation and would be more suitable for a given time period, however the actual time frame of the project might be extended due to client has multiple sub-projects and they are falling back on the schedule. Nonetheless, we have scheduled interview with me and new client for next week Thursday and hopefully we can come to a mutual agreement.

It was beneficial to meet our colleague from another site and have knowledge sharing session. We were able to discuss our project and show what potential challenges might arise. Of course, we have access to repositories of other teams and any other team can see our repository and hopefully learn something useful from it. It makes a huge difference if additionally, we could ask questions about repository and see what was not straightforward, these knowledges would not be possible to extract just by looking at the code. Especially there was a user story which said to configure some service and we have learned from our colleague that they had to implement it from the scratch. We would not be able to understand it from ticket system and we would make totally different estimations for our work. At this point we know that there would be several projects similar as our colleague's project but just adopted for different markets. We would be able to make more accurate estimations for them and we would be able to reuse solutions. It would give us some competitive advantage over other consultancy companies. From client’s perspective it also would make sense to give projects to team that are more familiar with it, which would mean saving time and budget.

One thing was still bothering me that I don’t have certainty of what would be my work for next month, there are multiple scenarios of what might happen. We still don’t know what our next sub-project and current sub-project is takes a small portion of our time. We are also not able to bill customers for time we are waiting and estimating new projects, which means that our actual utilization level dropped significantly. On top of all of that there is a solid possibility to start new project, leave a team and onboard to a new team. I think that we established some nice working processes in our team, and we were able to get nice velocity with actual work. Naturally that what consultants do, they switch projects and teams often. This is new skill for me, it easy to get carried away and focus on the coding and forget that we are trying to design and develop solutions that would bring value for the customer in first place. This situation would reoccur in my future work, it is a valuable skill to have in software developer path.

We have planned to visit our customer and colleagues next week. Purpose of meeting the customer was to get to know each other better and establish trustworthy relationships with the client. It would help us significantly, if we would be able to interact with the customer on their premises and asks questions that we have about project in order to avoid miscommunication.

Additionally, we have planned to meet all our colleagues who are involved in this project and have retrospective sessions, discussions and knowledge sharing sessions. It would help us to establish new ways of working with client and to improve working processes. We have noticed that there are many similar projects that could be potentially our projects and knowledge sharing sessions would help to create better estimations and understand what need to implement by our company and what could be used from customer implemented services. Team building activities were planned as well to get to know each other and raise team spirit. We had a chance to meet some of our colleagues while they have been visiting our site and of course we have communicated on Slack.

For me it was the first time I must go to another country to meet the clients, so far, I was working with Finnish clients and we often had face to face meetings. I was excited to meet our colleagues and share impressions about the project also I was a bit worried to meet our client since we had questionable situations with our workflow. I hope that that these meetings would show our transparency towards the client and better level of trust could be achieved.

3.7 Observation week 07

Monday 28 October 2019

I have started my working week by travelling to another country in order to meet my colleagues and have a round of discussion about the project. The plan is to have knowledge sharing sessions and workshops that would help to get familiar with implemented solutions. Of course, team building activities are planned as well, for the first time we would be able to meet all colleagues from this project. There were several meeting sessions planned with the customers, in order to get to know each other better and we would have the ability to give feedback and ask questions about new sub-projects.

After lunch we have arrived in the office and met our colleagues, for this day we have planned only team building activities since representatives from client's side are fully booked up until Wednesday. We had a tour in the office and went for lunch with colleagues, after we went for team building activities, which took all remaining time of this day. We have reached hotel lately and we have been exhausted from such an intense day of travelling and team activities.

Tuesday 29 October 2019

There were still some tasks left in our backlog, I have decided to take a task about fixing vulnerabilities in our frontend code. Pipeline is setup so that it would not allow trigger build of production stage if there are vulnerabilities. I have identified vulnerability by running from terminal command npm audit, it has showed me that package react-scripts relies on package Handlebars and that the current version of Handlebars are not safe. After some research on the internet, I have found out that it is possible to modify package JSON file in order to enforce specific version of package. It was a simple task but took some time to find out how to solve this issue, thankfully there is nice informative pages in npm package registry, and they could be nice guide in order to see what packages should be upgraded.

For the rest of the day we had a meeting planned for retrospective with all teams involved in this project. We have booked a room for four hours; we have gathered in total ten people involved in this project from across different sites. We have a round of discussion what was good and helpful and what was not that good and become an obstacle. We identified six items which should be prioritized, and we choose who might be responsible to take actions for these changes.

Wednesday 30 October 2019

For today we have split team members into two groups, one group would meet a new product owner for new sub-project and other part would visit client premises and get to know client's team responsible for validation services.

I have some spare time and decided to take on a task for updating Comma Separated Values file (CSV), which aims to populate data entered by the users. Recently there was a request to add a new field to the form for business users, we must add contact person field. We have created a field on frontend, and we created placeholder in state object for new input. However, we still must pass this data further down the pipe so it would eventually end up in CSV spreadsheet. For this task I would have to use different repository which consists of serverless Lambda functions. Serverless lambda functions are functions that are executed in cloud on demand. I must locate function responsible for generating CSV spreadsheet and modify the code to include additional field. It was relatively easy task, but it required to get to know new codebase on new for me repository, but also was beneficial to see what is done with data when it is submitted forward to third-parties. I had some prior knowledge about serverless Lambdas and did some simple tasks with it, but this task taught me new skills, for example how to create the comma separated value spreadsheet and how to insert data to it.

Thursday 31 October 2019

We have planned a session for estimation next three sub-projects, these projects are almost similar, but they are targeted for different types of customers. Priority number one is to deliver a sub-project for private type of customers, second for business customers. We have had a conference call with product owner for new set of sub-projects, he has explained business idea of new projects and set priorities. It is expected to be able to launch services in December this year.

Our assumption was that since sub-projects are really like one another it would take less time to deliver second and third sub-project from this set. We would be able to reuse 90% of our solution and add additional services where it is needed. For example, for business customers we should add a specific check of Chamber of commerce when business customer would enter unique identifier.

I had separate conference call with new client, we have planned a rotation in current project. Client explained what company is trying to achieve with new product which is connected to advertising through social media channels. My role would be as full stack developer with more tilt to backend and it is required to fill in this position in the beginning of November. Project seems to me interesting and challenging, there were new things for me, and it was mentioned that it would require some time to onboard a new project due to the unique architecture of their solution. After long discussion we have agreed to have a face to face meeting with development team and have an interview on client's premises. There is a high probability chance for me changing to a new project.

Friday 1 November 2019

Today is the last day at the premises of our colleagues, we have planned to finalize our estimations for next sub-projects. I should say that the process of estimations has been improved, we started to help each other with not clear tasks and knowledge sharing sessions also helped. We have noticed that several sub-projects a like what we have done, this factor would help to reuse our solutions and decrease time for development process. Of course, new sub-projects would have differences and they must be adapted for given market, which might have unique rules.

After estimation process was complete, we have received and email from the client that change requests were approved and we have been asked to proceed promptly with them. Basically, it was two tasks, one was about change of text for modal that is shown to a user and the second one was a bug fix for date picker component.

I have taken a task with fixing date picker component, after some testing, I have been able to reproduce the bug locally. It seems that date picker component was not displaying navigation arrows for selection of the year. After consulting with my colleagues, we have found out that this behaviour was fixed in a new version of CSS library, I must update version of CSS library in our project. Unfortunately, it has introduced some breaking changes as well, some components change its layout. I had to go through the whole user flow and ensure that it works as intended, I have corrected some layout of components and replaced one component, since it was deprecated in new version of CSS library.

Weekly analyses

I have finally met all my colleagues and we have spent nice week discussing the project and finding better ways to arrange our work. In a first day we had team building activities which consist of going to team games activities. We have split for several teams and we had to take part in different challenges it was fun activities and helped us to get know each other. Of course, some of colleagues were familiar with each other but for me there was new people to get acquainted with.

We all have been looking forward for retrospective session, where we could share our impression about the project and try to figure out how it might be improved. We have noticed that we have similar concerns and we did same mistakes by doing work without approval. We have discussed that some of these mistakes would not happen if we would have proper onboarding in the beginning of our project, but at that point it was not possible due to tight deadlines and unavailability of stakeholders.

We have noticed that even though an idea of this project is to reuse code from previous sub-projects, we have created our own components that were like each other. It was not time efficient and we have discussed a possibility to create a shared repository for frontend components written in TypeScript. This way we would have readymade components and we could just use them in new sub-projects, however we decided not to do that since there was a promise made from client side that team who is responsible for custom CSS library would provide React version of their components. We have decided not to duplicate work and wait for release of updated CSS library.

Both teams have made same mistake by not verifying budget with customer first, we have found out that we thought that if product owner is making a request for changes or implementation of some features then the budget is allocated. We have expressed that this approach create mistrust with development team and product owner. Every request must go through estimations and then submitted to client; we have proposed to open discussion with the client if it would be possible to make this loop shorter. We have proposed that product owner may fill up request for a budget and we could help with estimations.

There were suggestions to help customer promote scrum methodology within their organization and try to change their culture. Of course, it is out of our scope and we should focus on understanding the customer and trying to help them rather trying to change their ways of working.

We have decided to open our communication channels to client as well, we believe that if they would see our internal discussions it would help to better depict status of the project. Now clients only see the change of request and we ask some questions if we are not sure how it should work from point of business logic. We assume that it would help to see that we might have problems with some tasks, and it would communicate a message that original estimations should be adjusted. Additionally, we hope to achieve a better level of trust by opening our channels to client. Some of our colleagues were expressing doubts about this approach since we should keep development process separate from client and it might introduce new challenges with the client. Both sides have valid points, we have decided that we would make a step towards opening to client in order to have better relationships established.

We have discussed multiple things and we have come up with many suggestions how to improve working processes. We have decided to pick six most important ones and proceed with them. We went through the list of suggestions and we divided responsibilities for these suggestions. I vouched for contacting custom CSS library team and asking them about status of reusable components for React library and approximate time when we would be able to use them. Within a team we had agree to continue discussion about creating our own repository for reusable components in case if we going to stay in this project for longer period and if it would take long time to wait for update of custom CSS library.

Aside from team building and retrospective sessions, I had a chance to meet product owner from client's side. We have discussed our working processes and further prospects in the project. Product owner was glad to continue work with our team, he stated that we were able to deliver good quality product in short period of time. Original plan was to visit client's premises, but unfortunately premises was fully booked, and we have organized meetings at our company's premises. We were aiming to ask technical questions from client's IT department, but only product owner was available at the time. It was beneficial to talk to client in person and improve our working relationship.

During our trip I had remote interview with new potential client. They are looking for two full stack developers to join in beginning of November. Technical requirements are NodeJS, TypeScript and Kubernetes. Kubernetes is system for automatic deployment, scaling and management of containerized applications. (Kubernetes, no date). It is interesting and challenging case for me, new potential client work with massive amount of data and aims to create financial metrics for its clients. We have discussed business goals that they aim to achieve, and we have schedule technical interview with developer from client's side on next week.

3.8 Observation week 08

Monday 4 November 2019

There were some pull request that was open and must be reviewed, I have started my day with reviewing and merging pull requests. In last week there was not much actual work done due to meetings with client and teams from other sites.

I have noticed that we have not updated our production environment for a long time. There are multiple tasks that are waiting for review and approval of product owner. The plan was to update internal environment and make sure that all the changes are approved by all parties and then we would update production environment.

Our setup for production stage in continuous integration pipelines watches master branch of the repository and updating master branch would trigger build of production environment. We must merge three repositories: frontend, backend and data export. These three repositories should be up to date because it would ensure correct data flow.

For a whole day I was reviewing pull requests and making sure that we do not introduce breaking changes to our application. My concern was that since we updated how data is exported to CSV file, we might also introduce breaking changes on the client's side. Issue may arise because we added one more field to CSV and If client has set up some script to read CSV file and it expects certain columns to be in specific way then logic on client's side must be updated as well.

Tuesday 5 November 2019

I have submitted request to client to clarify situation about CSV file generation. For today I didn't have any open tasks left and I must wait for marketing and product owner review in order to proceed.

Meanwhile I have received an email from new potential client, they would like to schedule an interview session with me on Wednesday. It would be technical interview with a developer from client's side, we would have two hours technical interview where my skills would be assessed. Additionally, they have sent me a code review assignment that I have to review and come up with better solution where it is possible.

The code review assignment was about fetching different metrics and combing this data to create statistic report for a user. It consisted of three files; I have decided to write comments directly in code, I was leaving the comments in the same manner if I would do pull request review. In my opinion pull requests are meant to open discussion of possible solution rather than submitting work for assessment.

I have identified multiple things that should be better, and it would be nice to improve performance and readability but still it was not critical. Then I have found out that in pull request there was application program interface (API) key written in plain text, at this point it is necessary to block this pull request. It is dangerous to have API key exposed in the codebase, some people might find it and then there might be severe consequences. Even if the there was a commit with API key and the branch was not pushed it is still possible to retrieve the key from commit history. In this case it is required to revoke API key and create new one. Sensitive information should never be exposed to public; it is possible to use environment variables to store API keys securely.

Wednesday 6 November 2019

I have interview scheduled for 10:00 AM and I have decided to go straight to interview. We have started our meeting with introductions and then we proceed to code review assignment. I have showed my findings on what was in my opinion good parts of given pull request and we mostly discussed what could be done better. I have written possible way to refactor code to improve readability, performance and removed API key from the code itself.

During our discussions I have received a lot of additional questions about the techniques that were used in example code. The Promise object represents the eventual completion (or failure) of an asynchronous operation, and its resulting value. (MDN web docs, no date). Promises were used to execute asynchronous calls to fetch required data. It was implemented in a way of chaining promises with '. then' syntax, one Promise would be resolved or rejected sequentially. I have suggested to use different approach and parallelize promise calls, in that way data could be fetched faster and if one of the promises would be rejected then it would be still be possible to get data for other promises. I have implemented ES2015 feature - 'async/await' which allows to write promises in a clear manner it helps to create more readable code.

After code review assignment we have proceed to discuss various topics about software development. The purpose of this discussion was to find out my level of knowledge relevant to their development environment. We have discussed databases, NodeJS, TypeScript and Kubernetes. I have felt that for multiple questions I didn't have an answer and I felt anxious about the fact that I was still lacking in depth knowledge that are required for new project. I was told that they would let me know by Friday if I would join their team.

Thursday 7 November 2019

After interview I was still feeling a bit anxious, because I was really interested in new project and I believe that it is great opportunity for me to learn from new team. Previously I was not involved on development of backend on that high level and most of my previous projects were relatively smaller scale.

Meanwhile there was not much work available now, I have reminded to our team that we should update our production environment since some changes to content and functionality of our service. We must update first backend and data export repositories and then finally update frontend repository in order to keep minimum down time. We have encountered an issue that unit tests were failing for master branch for the frontend repository which means that automatic deployment were blocked. It was really confusing since our production branch should be the same as internal branch and internal branch were passing all tests.

I have decided to first isolate the issue and tried to reproduce it on local machine. I tried to launch unit tests and they have been passing fine and it was not possible to reproduce an error in local environment. I have decided to contact our colleague from another site, he was responsible for repository of continuous integration pipeline. He has advised me to check Docker file and see what kind of node version environment uses. Docker is a tool designed to make it easier to create, deploy, and run applications by using containers. Containers allow a developer to package up an application with all of the parts it needs, such as libraries and other dependencies, and ship it all out as one package. (Opensource, 2019). We have found out that it was using latest version of NodeJS for production environment and for internal it was using stable version. It seems that this was the root of the cause, sometimes new versions of node might be incompatible with other libraries. In our case Jest test framework was incompatible with latest NodeJS version. We have decided to use for production stage the same version of NodeJS as it was in Internal stage. It helped us to solve this issue and I have learned valuable lesson that in production stage it is better to use stable version in order to ensure work of other dependencies.

Friday 8 November 2019

On Friday morning I have received a call from project manager of new potential project. I was asked whether I would have time today to come to their office and have second round interview with him. He told me that development team said that even though I don't have much experience they think that I might be suitable candidate to join their team and final decision would be made by project manager. It was good idea to meet him in person since we just had a chance to talk briefly during conference call.

We have met at their office after lunch, he has reserved a two hours session for the interview. We have started discussion by round of introductions and just casual conversation. This time we have been mostly focusing on business side of the project. He has explained me what the aim for the new project is and that they would like to extend their current team with two or three new developers. The project itself would start in January but they would like one person to join in November in order to get help with ongoing development.

He has asked me what I know about Kanban and what would be the difference between Kanban and Scrum. Kanban is a workflow management method designed to help you visualize your work, maximize efficiency and be agile. (Kanbanize, 2020). We have discussed pluses and minuses of both frameworks and he said that for their specific project Kanban style is more suitable.

Additional task was to come up with solution for hypothetical client who need specific metrics for their hypothetical advertisement campaign. I have started to ask questions about needs of this client and what is expected result in order to define clear scope. We have discussed that communication is the most important part when we work with user of their platform because with limited amount of time and resources, we must come up with viable solution that would help the user. These tasks were mostly directed to see my way of thinking in terms of business and whether I would be able to understand the needs of client they are serving.

Project manager asked me when it would be possible for me to start work on new project and told me that he would tell me on Monday about final decision.

Weekly analyses

In order to prepare for interviews for this week I must refresh my knowledge about technical stack that new potential client is using that the client is using. Mostly I have used search in the internet to get relevant information about the company and its core business model.

New potential client operates in a field of advertisement through various social media. Main product is platform that helps advertisers to create and manage advertisement campaigns in social media. There is multiple business side terminology used in client's product and understanding of them is crucial for developer. At the interview with product manager I was told that it could take up until six months to integrate fully to the company, but the whole length of potential project is estimated for six months as well.

I have never worked before in product companies I would have to get to know new organization and work under supervision of project manager. Of course, this is standard situation for consultant to work at client's premise, integrate to new teams and learn new technologies. However, it puts a lot of pressure on a person. Since I am at the beginning of my career development path, I would say that I am not an expert in software development, and I might not be able to produce solutions promptly due to learning curve.

New possibility to join new project was exciting since I would be able to learn a lot of new from team of professionals but at the same time, I was anxious that the level of the team was rather high, and I would be only one junior developer. The requirements for this project are rather high and it is expected to be able to deliver result promptly. It might be the first time for me that I would have to be at client's premises for a every workday for next six months. So far, my clients were in other countries and I was working from Futurice office remotely.

From other perspective it helps me to educate myself and progress on my career level path. I feel responsibility and I would like to help people to build good quality software and this is my main motivation towards learning new things. I know that if I would be accepted to new project, I would gain valuable experience in new field for me.

Another downside is that I don't want to leave my current team. It has passed two months of work with current team; I believe that we have built trustworthy relationships and we created productive workflow where we were able to deliver good quality results for our client. We still have difficulties communicating with our client, but we are trying to improve our relationships trough transparency and showing we can deliver results on time.

3.9 Observation week 09

Monday 11 November 2019

I have received an email that I was approved by client to join their team in two weeks. Meanwhile we must onboard new member of the team for current team and introduce new member to the client and team members from another sites.

We found out that our new team member will join us from tomorrow, and it is estimated that she is going to work for period of four months. It is appropriate moment to make a rotation since we are not in phase of active development now. I have notified people responsible for my current project that I am going to leave this team and switch to new project. Unfortunately, it was not good news, it was promised to current client that we would keep team in same capacity and all team members are familiar with working processes of the client. This matter must be discussed with a client and we should find a compromise.

Since we still waiting response about our estimations from client, there is no development work available now.

Tuesday 12 November 2019

We have met our new colleague this morning, she is experienced software developer with more than ten years of experience. We decided to spend whole day for getting her onboard and introduce to the project structure. We have explained what we have built in past month and oncoming potential sub-projects.

We use white board extensively it really helps to describe communication flow between us and the client, project’s structure and statuses of current tasks. During our initial discussion with new team member we have filled white board with useful information.

Next step is to notify our client that there is rotation happening inside of our team. New team member must go through same procedure of getting access to necessary resources which might take some time. We have notified project manager and product owners from client's side that our new colleague starts from today and we have requested access for her as well.

Wednesday 13 November 2019

The response from the client's project manager was that they are fine with the fact of rotation, but they would like to keep same price for a development day. We must find a compromise and we must agree to these terms even though, new team member is considered as senior software developer and her base price is much higher than mine.

At daily meeting we have presented new team member to product owner and asked about status of getting necessary credentials from client's side. We have been told that the request has been made and that hopefully we would be able to work in extended team starting from new week onwards.

We have continued the process of on boarding for new team member. We went into details of technical side of the project. Since we have a predefined technical requirement that applies to every sub-project. We have explained what we have experienced so far and what kind of problems we encountered. It would be beneficial to do some task together in pair programming but unfortunately, we were still waiting for marketing reviews from previous sub-project and we still have not heard anything from other sub-projects.

Thursday 14 November 2019

For today we have no planned work, so we continue process of knowledge sharing with new team member. We decided to spend this day studying how to use client's custom-made CSS library and some discussions about pipelines for continuous integrations.

We spent whole day by browsing codebase of previous sub-projects and discussing better approaches that should be implemented. We once again discussed possibility of creation repository of common React components. During our team retrospective meeting we had agree to get in contact with a team that responsible for custom CSS library maintenance. We have received a response that it is planned to implement this feature in near future, however there was no concrete dates set.

Friday 15 November 2019

Our team leader has received an email that we received new sub-project and we are able to start work from next Monday. It was good news for us, we have extended team and one week of work ahead of us. According to our plan we would be able to cover major part of tasks if there won't be any impediments. However, we have received a sub-project which was not like our previous one. We were confused, we believe that we would be able to deliver faster and better results if the sub-project was similar. We mentioned these benefits when we have been submitted our proposals for sub-projects. Unfortunately, client decided to give opportunity to other companies.

During the daily meeting with product owner we have discussed new sub-project and what is expected timeline breakdown. Product owner said that we would have two weeks of development, if there won't be any impediments. Next we would have penetration tests and marketing review as we had before. Additionally, he mentioned that we do this project for two markets simultaneously. Aside from language there would be some differences in implementation of services due to different policies of specific markets regarding financial operations.

Weekly analyses

Timing for this week was good, we didn’t have heavy load of work, just some small fixes and creating estimations for new potential sub-projects. I was glad that we have a new team member, she has long track of experience in software development and I believe that I would be able to learn from here new set of skills.

We didn’t have any established on boarding process for new team members. We have focussed our efforts to create pleasant on boarding experience. First, we have discussed our client and how communication is established in current project. It is confusing part with process of change of requests and that from client's side we have waterfall like approach. The waterfall model is a classical model used in system development life cycle to create a system with a linear and sequential approach. (The Economist Times, no date).

She has replied that it seems counterproductive and we should try to offer our client to change the way how working processes are established. She had nice points about how to improve processes, for example we could more closely use Scrum methodology and work in Sprints and deliver incremental result. We have decided to try to introduce this idea in stages to the client. In my opinion we have valuable points about organization of working process, and we would like to help our client to improve it. Our plan is to introduce this idea gradually and support our ideas with facts from work experience. Ideally, we would be able to save time and budget for the client and create nice workflow for development teams. We hope that development teams would be able to focus on incremental progress of the projects that are this point more familiar to them.

During the technical breakdown of the project, we had good retrospective experience of what has been done so far and what could be improved further on. We found out that technical stack for new team member was rather new and she would have to learn to use new libraries. In my opinion it was beneficial to go through development cycle of previous project and discuss different topics about it. We have come up with proposal to the client how we could possibly improve efficiency of the processes. At the moment we have set of requirements in order the task to be completed. This creates a bottleneck in development process, it is required to have multiple dependencies to be completed. Especially it is a blocker in the beginning of the project, when starting from the scratch. Due to this impediment we are not able to release our product frequently and it leads to increase of feedback loop from marketing and management. To be more specific, one of the first tasks is to setup environment for continuous integration, which consists of four stages. In order to have final stage Deployment we need to ask for registration of domain which could take several weeks. Therefore, the task which is supposed to take few days becomes a task for few weeks. Especially when we consider that this is fundamental task in order to satisfy acceptance criteria of End to End test for all following tasks.

One of the best ways to get familiar with the project is to do some related coding tasks, it would help to understand data flow and what kind of aspects project has. Unfortunately, now we were not able to provide active task but rather show some retrospectives. Another interesting point of these project was that for new team member start to work on assignments it is required to wait for a week to get credentials from the customer. Considering that originally whole sub-project is estimated of two weeks of development, it takes half of the time just to get environment set up.

It is still the case for new teams, who starts to work with this client and time while new team members are awaiting is not billed. From customer perspective no actual work has been done, however from our perspective days that we spend waiting is missed opportunity to do billable work for other customers. Because of this fact some people in Futurice were not satisfied how business side is handled and consequently I was proposed to another client. New client offered contract for full time for next six months. From business perspective it makes sense to change projects and increase my utilization level. Personally, I wish we could establish better processes with existing customer and have nice workflow.

As I described before I am still novice actor and during this project my skills has improved to skilful performer. I have improved my skills with backend side by implementing logic for serverless Lambdas. Before starting this project, I had some basic knowledge of Serverless framework and even had some simple lambdas created by myself. Nevertheless, I have never thought how to create serverless functions for big enterprises where many factors must be considered. Security of services must be on industry standard level, since sensitive financial information is handled by our services.

My knowledge towards continuous integration has increased as well, now I am able to create and provision continuous integration pipelines. I have learned importance of stages for continuous integration pipelines and how to ensure stable work of whole application with end to end tests. There is always a possibility to have some bugs in application, but we must test for several possible paths in our application and ensure that we receive a predicted behaviour.

By accepting new offer for new project, I would once again become a novice actor. There would be set of new technologies that are not familiar to me. There would be new business case that has not much in common with my current tasks. From interview I have understood that they would like to have full stack developer with more tilt to backend, which would once again place me in novice actor position.

Of course, I have received some valuable lessons during this project and were able to learn from my team members and even teach them in frontend field. Most valuable takeaway from this project was interaction with client and how it could be possible to change mindset of the client for common good.

Nevertheless, whenever I change to new project, I feel that I once again become a novice actor in a lot of aspects. It is interesting from the point that this pushes me forward to exit my comfort zone and study new technology and at the same time it is challenging to become proficient in specific field.

3.10 Observation week 10

Monday 18 November 2019

This is my last week in the project and it seems that might have productive week. Our new team member has finally got her credentials for all required services and now she is able to use Bitbucket and access Jira pages. It took one week to get all credential for her thanks to product owner who was taking care of that matter.

We have received official contract for new sub-project, client has accepted our terms. We have agreed to start work from this Monday. We have checked out Jira board for this sub-project and we found out that there were tasks created by product owner and additionally content sheet was updated. It seems that product owner listened to our feedback and ensured that we have enough tasks to do from the start. He also pointed out two projects that were considered done well and asked us to use them as an example.

In the morning when whole team was in one place, we have organized internal planning session. We went through first four tasks and distributed them among team members, I got a task to create footer pages. This task was estimated for two days, it includes creation of footer component by specified standards of the client and adding support for several languages by using I18next library.

I have checked repositories of the projects that were pointed out as good examples by our product owner. I have noticed that they have similar service implanted but it was in different language. Bigger surprise for me was that text was hardcoded, team who was responsible for this project did not use I18next library properly. I have decided to remove all hard-coded text from footer pages and implement proper localization with I18next library, this approach would enable relatively easy switch to new language if needed.

Tuesday 19 November 2019

I was still on the task for footer pages, initially I was thinking that it would be rather quick task. But after discovering that footer component includes also eight separate pages with content, I have realized that it might take some more of my time.

During the daily meeting we have noticed that some content of other pages is referenced to content of footer pages. Frequently asked questions section for footer pages includes references for other pages, more specifically questions and answers are repeated. We have agreed with team members that I will take care of section of Frequently asked questions and they would be able to reuse them once changes are merged to develop branch.

Wednesday 20 November 2019

I have opened pull request with footer pages, initially I was planning to break it down to several parts since it became a massive pull request and it is usually a good practice to break down to parts big pull requests. Nevertheless, I have created only one pull request, my idea was that there was not much business logic implemented but rather a lot of content.

Meanwhile waiting for reviews from my colleagues I have decided to improve our workflow and automate process of testing and style checking. I have implemented a shell script that will check that name of the branch and commit message would start with name of Jira ticket. A shell script is a computer program designed to be run by the Unix shell, a command-line interpreter. (Kernighan, 1984) Jira has nice integration with Bitbucket that allows to effortlessly find relative branches from ticket itself.

Next I have installed Husky this is npm package that allows to run npm scripts when working with source control system. My goal was to run Unit tests and linting check before commit is pushed to Bitbucket. This way I would ensure that code is formatted in same manner and that unit tests are passing. If one of this action fails, it will notify developer that it was not able to push to repository and show error message. The same checks are implemented on continuous integration pipeline, so it would refuse to build pull request if one of the checks fails.

Thursday 21 November 2019

Pull request for footer pages were approved and merged to development branch. I have noticed that some pages were still missing content due to incomplete content sheet. I have notified product owner that we are still missing content by leaving comment on a ticket. Additionally, I have left comments in codebase that pages need to be improved when content in content sheet would be available.

We have discussed with my colleagues that it would be nice to implement logic for End to End testing. It is an acceptance requirement for all other task to pass End to End tests and it seems to us a feasible idea to put some efforts in order to have it covered from the start.

I have picked this task and started to analyse what is required to implement this solution. It is required to create a separate repository for End to End tests that could be executed against different environments. I have narrowed down scope of this task to be able to run test in local environment and development stage environment on continuous integration pipeline. Other stages were still not available for us due to waiting for getting permissions for Deployment environment.

I have started with local environment, this way I could validate my ideas and have shorter feedback loop. I have defined that I would like to have three scenarios implemented. First, it is successful path, the user enters valid data and able to go through whole process. Two other cases would take care of input of invalid data. For example, if payment account number is invalid, user would see appropriate error message.

Friday 22 November 2019

Successful path for the user is the most demanding part in terms of amount of work. I have to use Test Café framework and programmatically go through every step. It requires many iterations in order to ensure that headless browser inputs data to right field.

We could access field by id tag of the element, so if I need to input first name, I would target input field with first name tag and fill in value. This should be repeated for all other fields in form.

This task took my whole last day and eventually I have submitted pull request for the review. Locally it was passing whole sets of tests and therefore this could be used at Development stage of continuous integration and partially our pipeline would work and ensure quality of the codebase.

Weekly analyses

This is my last week in this project, in this weekly analysis I would present the analysis for this week and more detailed analyses of the whole project and my learning process would be covered in next section Discussion and conclusions.

For current sub-project we have had an extensive team size of four members, three members are senior developers and me as a junior developer. We had a detailed plan of work in Jira, all stories had been created by product owner. The stories in backlog were well defined, from this point we have created detailed tasks within the team. First four stories covered the base functionality of the application, that would create solid base for further improvements. However, stories are not considered done if all acceptance criteria have not been accomplished. As I mentioned before initial stories had a task to create a Deployment stage on continuous integration pipeline, which would take up to two or three weeks. We have discussed this matter with the client, and we come to agreement that we would proceed further with the stories even if they are not completely done.

We have received reference to two sub-projects that were considered as good practice example by the client. The client stated that oncoming projects should be done in a similar way. It was step up in terms of adapting policy of reusable solutions, we would use similar structure of application which would reduce further efforts for maintenance.

However, when I started to do my first task with footer pages that have eight pages with significant amount of content, I have noticed that projects that were considered as a good practice used localization library only for translating title of the pages. I was surprised to find out that previous team have hard coded content for the footer pages. The whole idea of these sub-projects is to create applications that would be relatively easy to adapt for different markets. Exactly for this purpose I18next library was in use, it helps to placeholders for text paragraphs which would refer to JSON files with translations.

The benefit of this approach is that if application needed to be adopted for different language it would require to create another JSON file with new translations that would follow same structure as previous JSON files. Maintenance cost would be reduced as well, since it is not required for a person to go to the codebase and manually change content but rather just change values in one file. I have shared my idea with the client, and we have agreed to adopt this policy for every other sub-project. I was glad that were now taking part in improving working processes. It means that our client trusts us and willing to cooperate for further improvements.

My final task in this team was to create a set of End to End test with the help of Test café framework. In previous projects testing tasks were carried out by our colleagues and within our team there was no one who knows how to create End to End tests in Test café framework.

I have started by looking up repository for End to End tests in previous sub-project, I have decided to reuse the structure for current sub-project. It was relatively simple to initiate use of framework, the only thing I had to change is that it should be executed in local machine, since we didn't have continuous integration pipeline working at that moment. Of course, all the tests were failing because they have been written for different application.

It took me several days to complete this task, partly due to learning curve to Test café framework and partly due to application specifications. At the moment when I have created these tests there were not many pages available from the user flow. I had to assume of how they might look like in future and I have left comments in End to End tests repository where logic should be improved once pages become available.

My main goal was to ensure work of continuous integration pipeline so our work, could be tested and reviewed by the client. Marketing stage would not build without passing End to End tests and therefore from the client's perspective there is nothing to review. This situation would increase time for feedback loop and create a situation where development team would do work that has not been approved.

For the period of ten weeks I have progressed from novice actor to skilful performer. It was sometimes intense experience of personal growth, but I think that as a software developer you receive real experience working with production codebase that must be implemented according to industry standards.

Thanks to my colleagues I have gained new set of skills and even were able to teach my colleagues about front end, especially about use of React library. We gained mutual benefits working together, we were able to build nice team spirit and implement agile methodologies within the team. Together with my team members we were able to face many difficult situations and gain valuable trust from our client. I really hope that working in this manner we could improve even more working relationships with the client.

I might say that I have grown as a professional in technical and business sphere. In next section discussions I would analyse my learning experience more detailed. I am very grateful for this experience and looking forward to meeting new challenges on my path with next project where once again I would start as novice actor role.

4 Discussion and conclusions

Before this project I was mostly working on the frontend side. However, I was able also to write backend code on Java several times, my university knowledge of Java was useful. My main skill was a valuable experience with React library for frontend and creating responsive web pages for the applications.

In the project that was in scope of this diary thesis, I have started my journey in this project as a novice actor. It was my first client in a role of a software developer in consultancy agency. Requirements from my role were different, I would still be able to rely on help of more experienced team members in terms of technical questions, but it is expected from me to work closely with the client and be able to produce value for the client.

When we had a first meeting with my team members, I have stated that I am still in the beginning of my career path, but I will commit fully to this project. My willingness to learn and level of commitment was enough to join the development team. Our team consisted of three developers, two senior developers and me as a junior developer. Within the team we all had different background and nationalities, we used English language to communicate within our team and with the client. Additionally, there were two more teams in different sites with the same team sizes.

From the beginning we were able to establish transparent and trustworthy relationships between team members. We have been able to express ourselves in informal manner and be honest with each other. We had daily meetings within our team and daily meetings with our product owner from client’s side. We have discussed our work situation openly and we were able to find compromise promptly. In my opinion, size of the team was crucial here, we have been able to have round of discussions and then move towards with decision. Our development team have not been stalled in meetings where we would not be able to identify next step for our project. There is high probability to increase time for making decisions when more team members would be involved. Considering our time constraints, it was an advantage.

First sub-project that came along was estimated for two weeks of development work for three developers. I have learned that our customer uses traditional waterfall methodology, where budget and time is predefined for the project. This approach was new to me, I have no experience working with traditional waterfall like methodologies. During our first conference call with product owner, we have learned that there is a fixed date when the application should be available for a public. It was confusing, due to the client used terminology from Scrum framework, but actually framework was not implemented. We even had Sprints, but idea of Sprint to provide incremental progress. In our case Sprints were extending from one to another and significant number of tasks were just moved to the next Sprint up until the application was done. It contradicts the main idea of Scrum framework, to produce small increments of a product that could be tested early.

Even though we have been able to deliver on time, and promise to go public was kept, our client was not satisfied that we did the work that was not approved. From our perspective, we wanted to help client to produce good quality product and deliver it to the market on time. From client's perspective budget of the product has changed and value of a product has changed as well. Development team should have informed client in advance when there were changes. These changes affected time and budget of the product. In my opinion it was misunderstanding of the working process, another team from different site had a same issue. Original plan was to have onboarding meeting with client at client's premises, where we would have a chance to get more familiar with working flow. Due to time constraints of the project we have postponed it.

I have learned important lesson during this project, I should ask for help more frequent if I am having troubles with the task. I had spent five days to find solution for date picker component, originally it was estimated for one development day. I have received valuable feedback from my team members that in these situations I should let my team members know that I have problems to find the solution. We would be able collectively find solution faster or we could move to another task if it becomes a blocker for a progress. I understood that team is bigger than sum of all skills of its members. Sometimes it takes courage to ask for a help, but by working together, we would be able to produce more value to the client. I think this is very important lesson for me that would be useful in my career.

My technical skills have increased as well. I have learned how to work with serverless framework for the backend. In my opinion it is useful skill that enables to work with cloud-based solutions a produce cost effective backend service. My knowledge of frontend framework has expanded as well, I have been able to teach my team members how to work with React library. In my opinion, you learn the most when you start teaching other people, because you should be able to explain in simple way how technologies work and it requires extending existing knowledge base. I have learned how to create and provision continuous integration pipelines in order to support flawless work of frontend and backend. In conclusion I would say that I have gained valuable skills that would allow me to create web-based applications and automate process of quality assurance and deployment.

After going through this project, I adapt role of skilful performer, who is able to create resilient web-based solutions, participate in teamwork and communicate professionally with the clients. My next project would put me in role of novice actor once again, but I believe that I am now more prepared for oncoming challenges.

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6 Appendices

6.1 Appendix 1. Abbreviations

Scrum	Software development methodology.
Product backlog	Scrum artefact which represents a list of features and bug fixes.re
React	Frontend library for creating reactive applications
Redux	State management system
Enzyme	Test framework
Jest	Test framework
Formik	Library for handling forms
I18Next	Localization library
Axios	Http client
Node JS	Environment
Typescript	Subset of the JavaScript language
Serverless	Framework for creating serverless functions
AWS	Amazon web services platform
Test Cafe	End to end tests framework
Browser Stack	Environment for testing the application in different browsers
Slack	Communication tool
Microsoft Teams	Communication tool
JIRA	Ticket system
Bitbucket	Source control system
npm	Node package manager
SPA	Single page application
Sprint	Time frame in Scrum methodology
Snapshot	Snippet of code
Browser console	Console available in developer tools of the browser
Handlebars	Web template system
JSON	JavaScript object notation
Kubernetes	Orchestration tool
API	application program interface

CSS	Cascading style sheets
Pipeline	Stage of a continuous integration platform
VPN	Virtual Private Network
SSH	Secure Shell
Regex	Regular expression